Short Communication

First observation of one *Maculinea arion* pupa in a *Myrmica lobicornis* nest in Poland

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Maculinea arion (Linnaeus, 1758) (Lycaenidae) is a fast declining species endangered in many European countries. In Poland *M. arion* has disappeared from the whole western part of the country within the last few decades (Buszko 1997). Caterpillars feed initially in the flowerheads of *Thymus* or *Origanum* spp. (Lamiaceae), to complete development in *Myrmica* colonies preying on ant larvae. Although all *Myrmica* workers transport caterpillars to their nest, survival is high only with the main host ant species, *My. sabuleti* Meinert, 1861 (Thomas 1995). Habitat demands of *M. arion* and its major host ant vary according to regional climate (Thomas *et al.* 1998), but almost nothing is known in this respect from vast areas in Eastern Europe and Asia.

In mid-June 2002 we therefore attempted to identify the habitat requirements of *M. arion* in Poland more precisely. A survey, which coincided with the emergence of the first adults, was performed at Gugny (52°24'N/18°59'E) in the Biebrza National Park (NE Poland) on raised, sandy land surrounded by fens. Three neighbouring dry hills, regularly grazed by cattle and wild game, were covered by sparse trees (mainly oaks and some pines) and bushes. *Thymus serpyllum,* the host plant of *M. arion,* was abundant almost everywhere in the turf and overgrew sandy places as well as parts of the site bordering on swamps. Areas within a radius of 2m around host plants were searched for *Myrmica* ants. All nests encountered were carefully inspected, progressing from the uppermost to the deepest chambers. Voucher samples (5-10 workers) were collected and identified in the laboratory according to Czechowski *et al.* (2002).

A total number of 51 *Myrmica* nests were excavated and 5 species were recorded, the commonest being *My. sabuleti* (27 nests, 53%). Thirteen nests (25%) of *My. scabrinodis* Nylander, 1846, 6 (12%) of *My. schencki* Viereck, 1903, 3 (6%) of *My. rubra* (Linnaeus, 1758) and 2 (4%) of *My. lobicornis* Nylander, 1846, were also found. Only one *M. arion* pupa in a *My. lobicornis* nest was recorded, about 4 cm below ground level in a chamber with ant pupae. The nest was hidden in a tuft of grass and was situated in the lower (but sandy) place of the hill about 5 m away from the edge of the wet area.

My. lobicornis, preferring cooler habitats than *My. sabuleti* (Elmes *et al.* 1998), has never been noticed so far as a host of *M. arion* or any *Maculinea* species (Wardlaw *et al.* 1998). Occasional individuals of the predacious *Maculinea* species survive in 'non-host' *Myrmica* colonies (Thomas & Elmes 1998). Hence, our finding does not allow to asses if *My. lobicornis* is a regular host ant of *M. arion* on the investigated site. Application of a population model developed by Thomas (1995) rather suggests *M. sabuleti* being the main host here as well. Possibly, pupae in *My. sabuleti* nests were overlooked during the survey, if these were hidden deeper in the ground, below the chambers where ants were observed. Moreover nests parasitised by *M. arion* are often deserted by ants and then invaded by neighbouring *Myrmica* colonies. The association of the single *M. arion* pupa with *My. lobicornis* could also have originated this way. Anyway, the unexpected finding reported here emphasizes the need for further studies on the host ant relationships of *Maculinea* butterflies, in particular in the more eastern parts of their distributional ranges. This seems to be vital for understanding the ecology and evolution of *Maculinea*, especially if we consider that this genus probably evolved in a steppe-like habitat in Asia (Fiedler 1998).

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